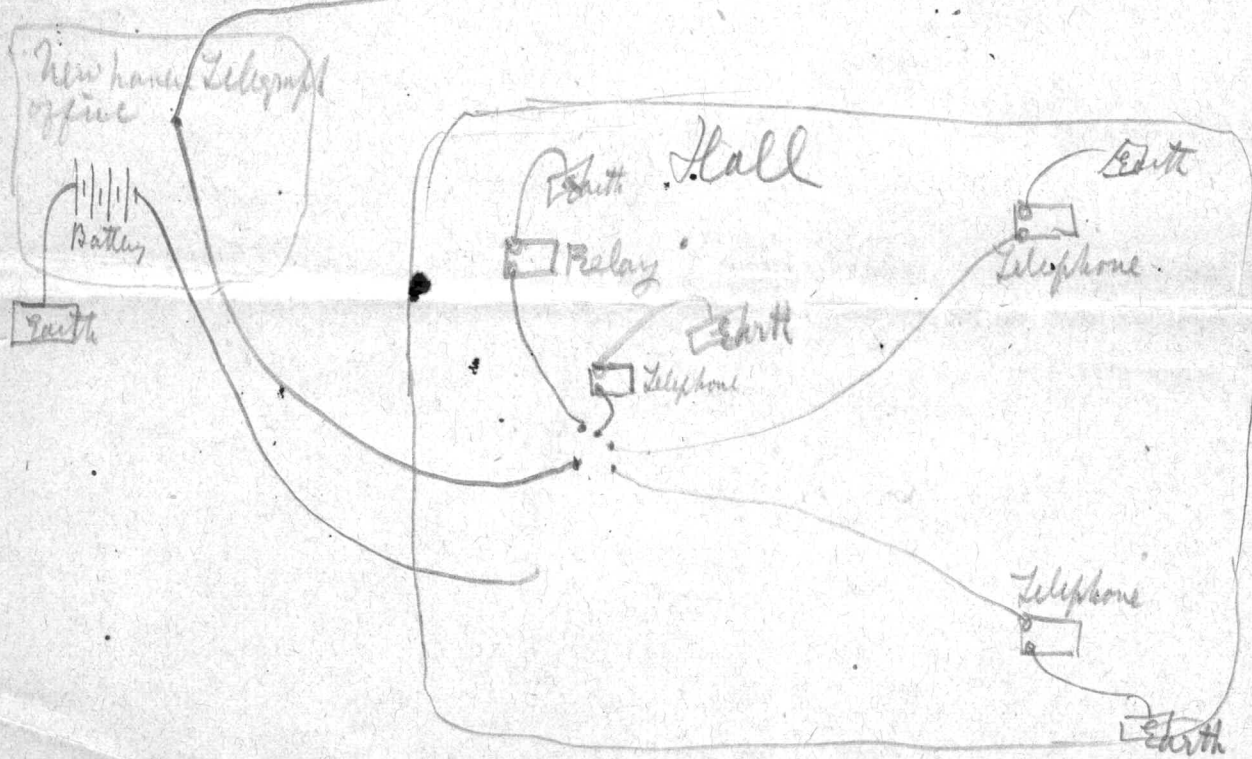


# New Haven Connections

## Line to Hartford



New Haven Telegraph office

Hartford Telegraph office.



New Haven Hall

Hartford Hall



Line to Hartford

Telegraph office

Hall

Relay

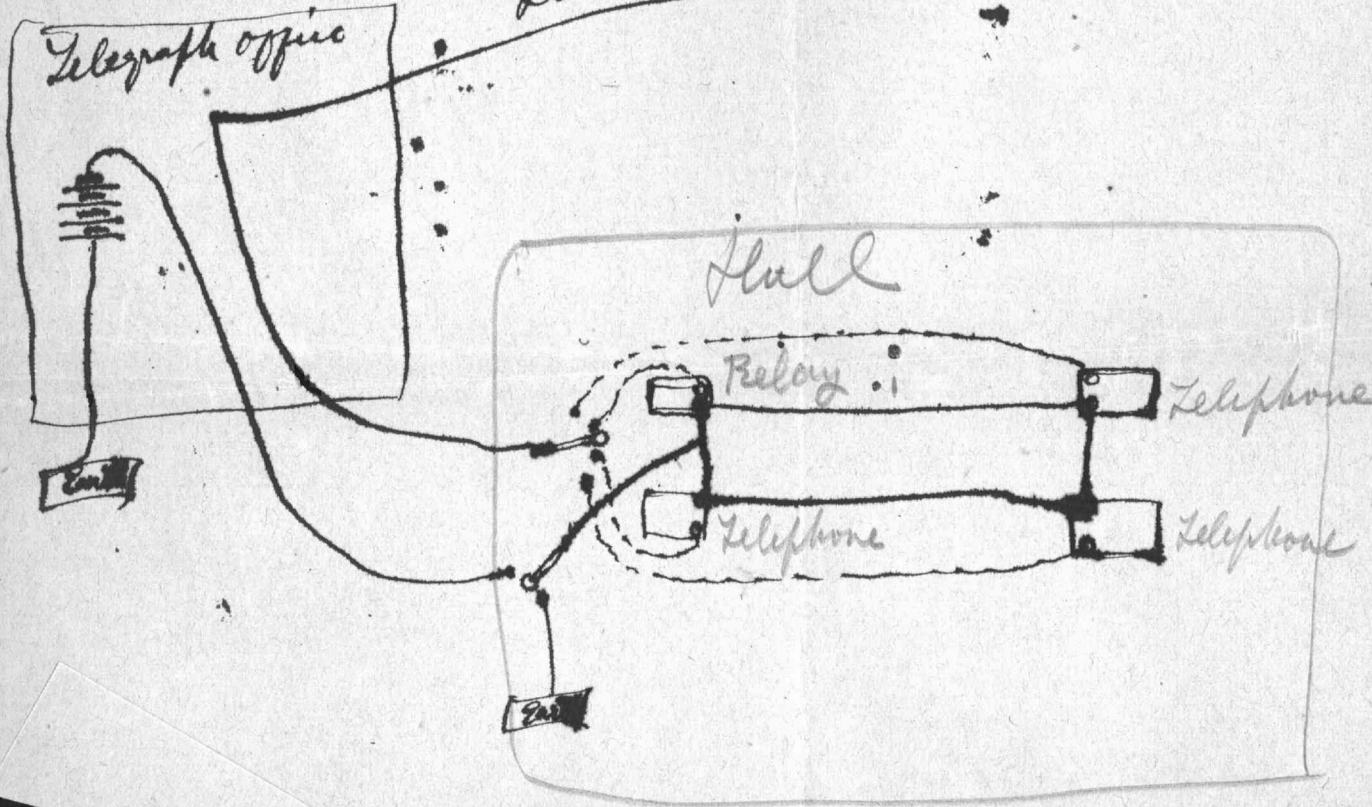
Telephone

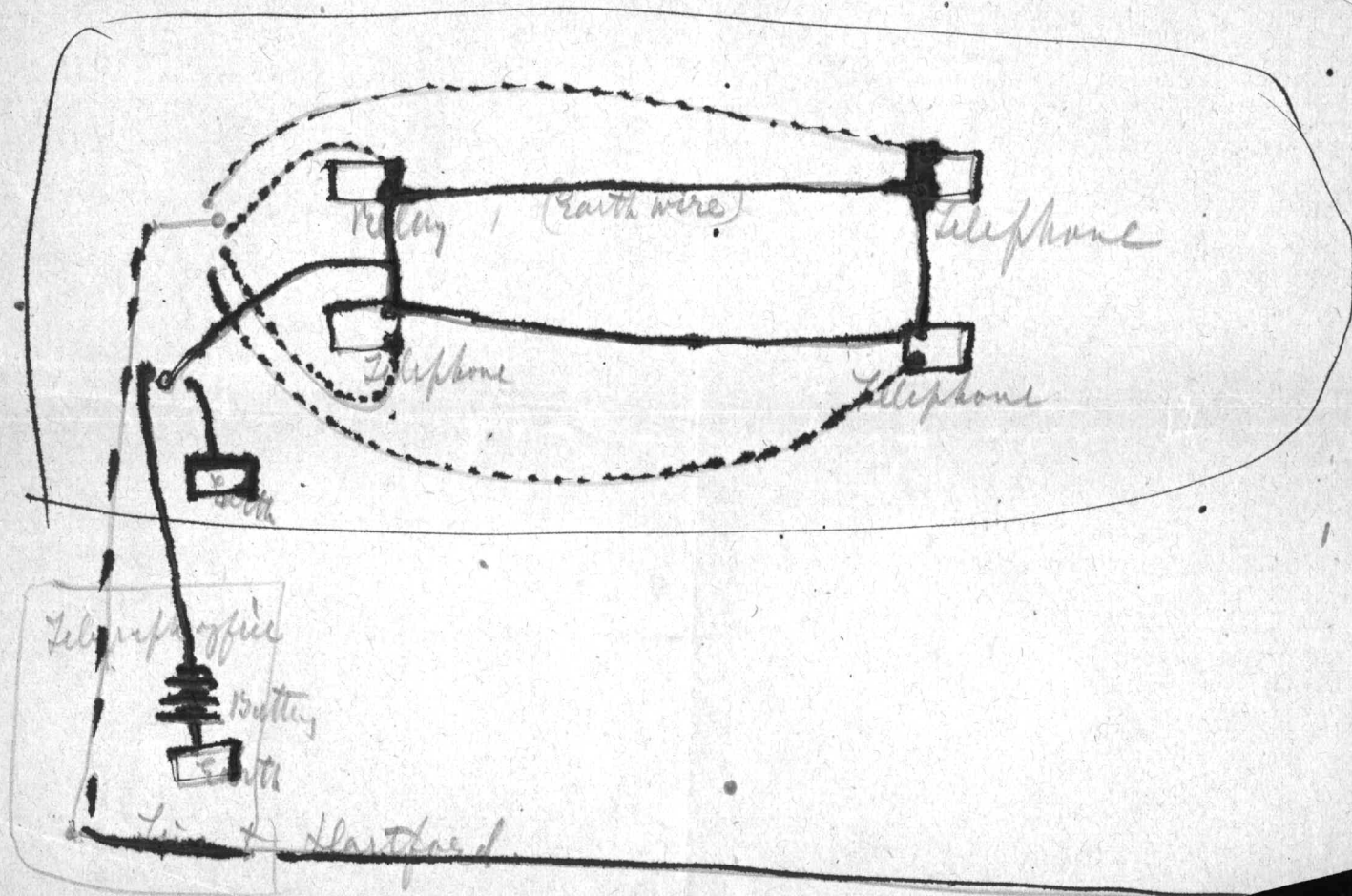
Telephone

Telephone

Earth

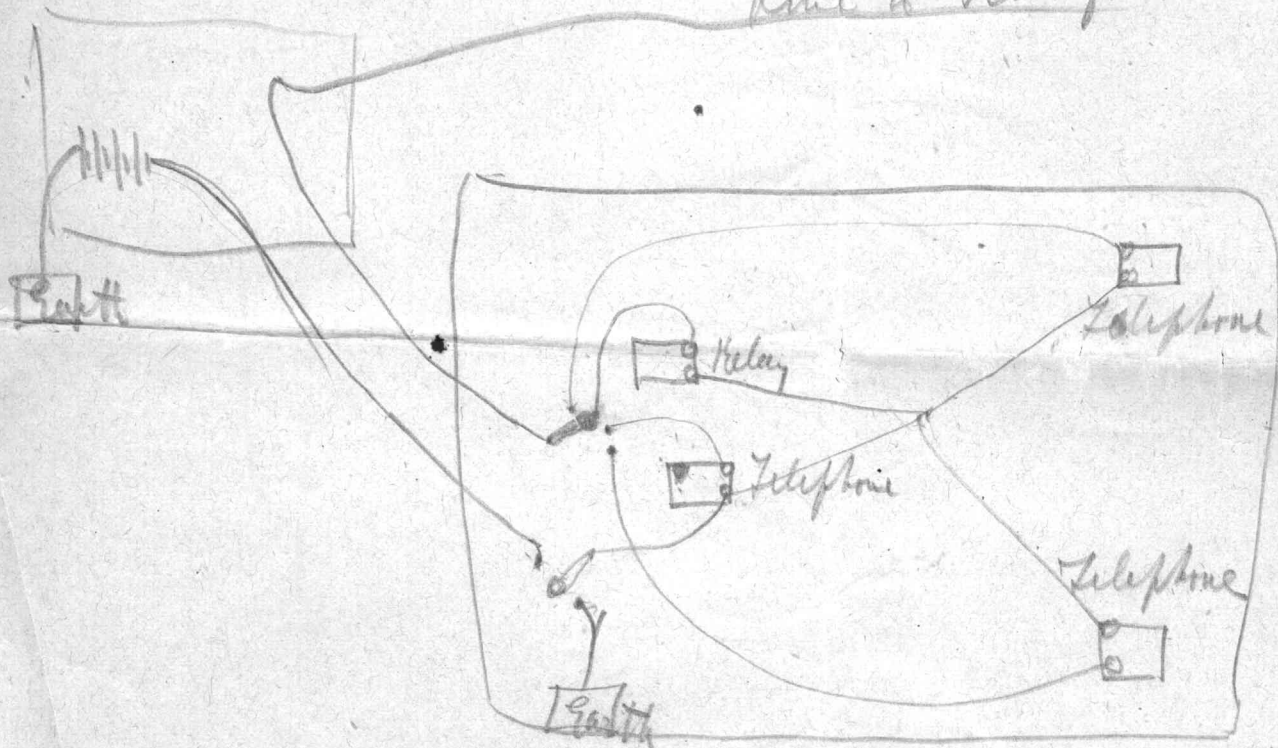
Earth

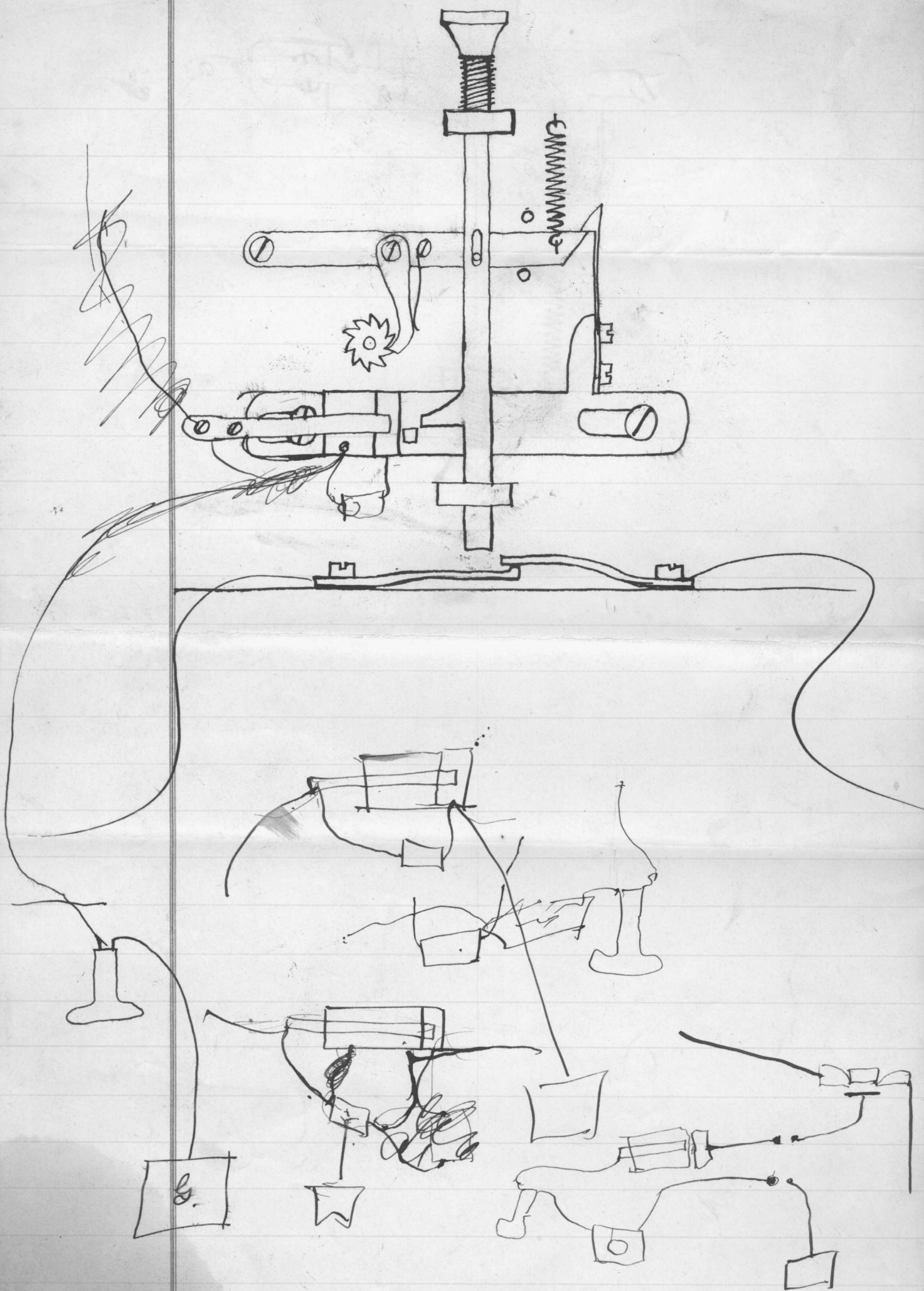


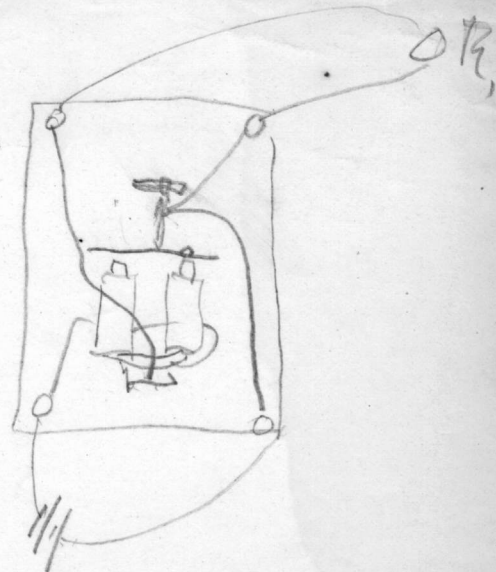




Line to Hartford

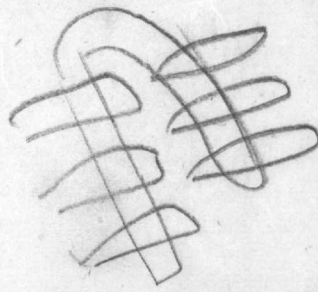
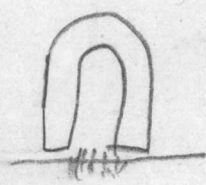
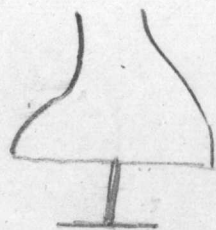
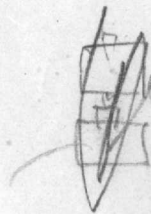
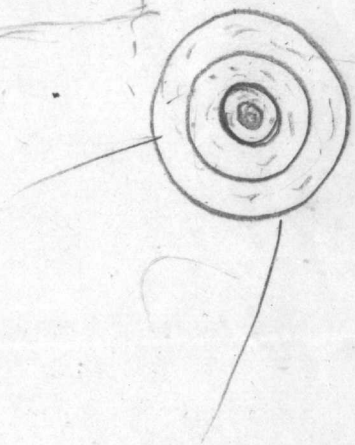
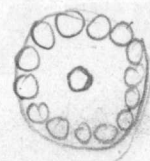
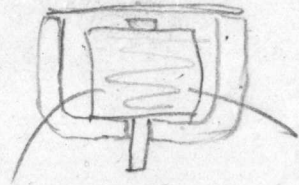
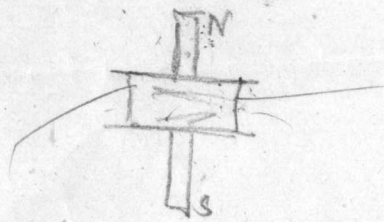
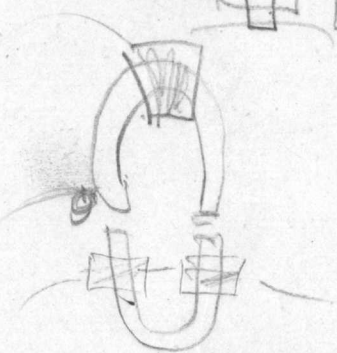
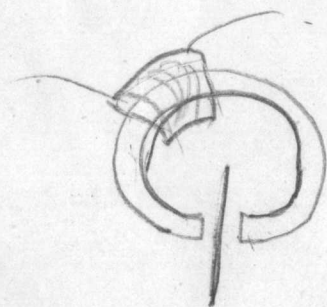
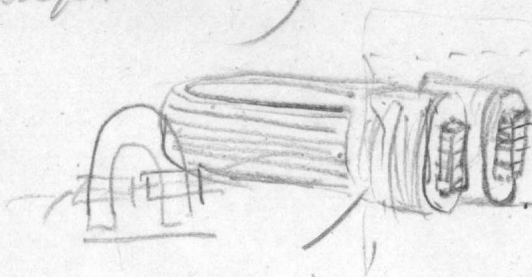
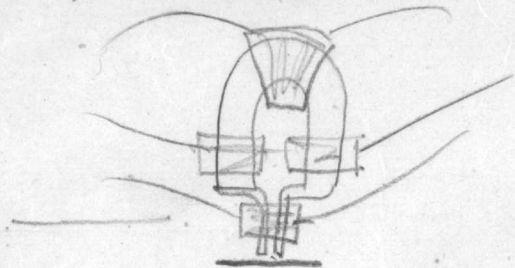






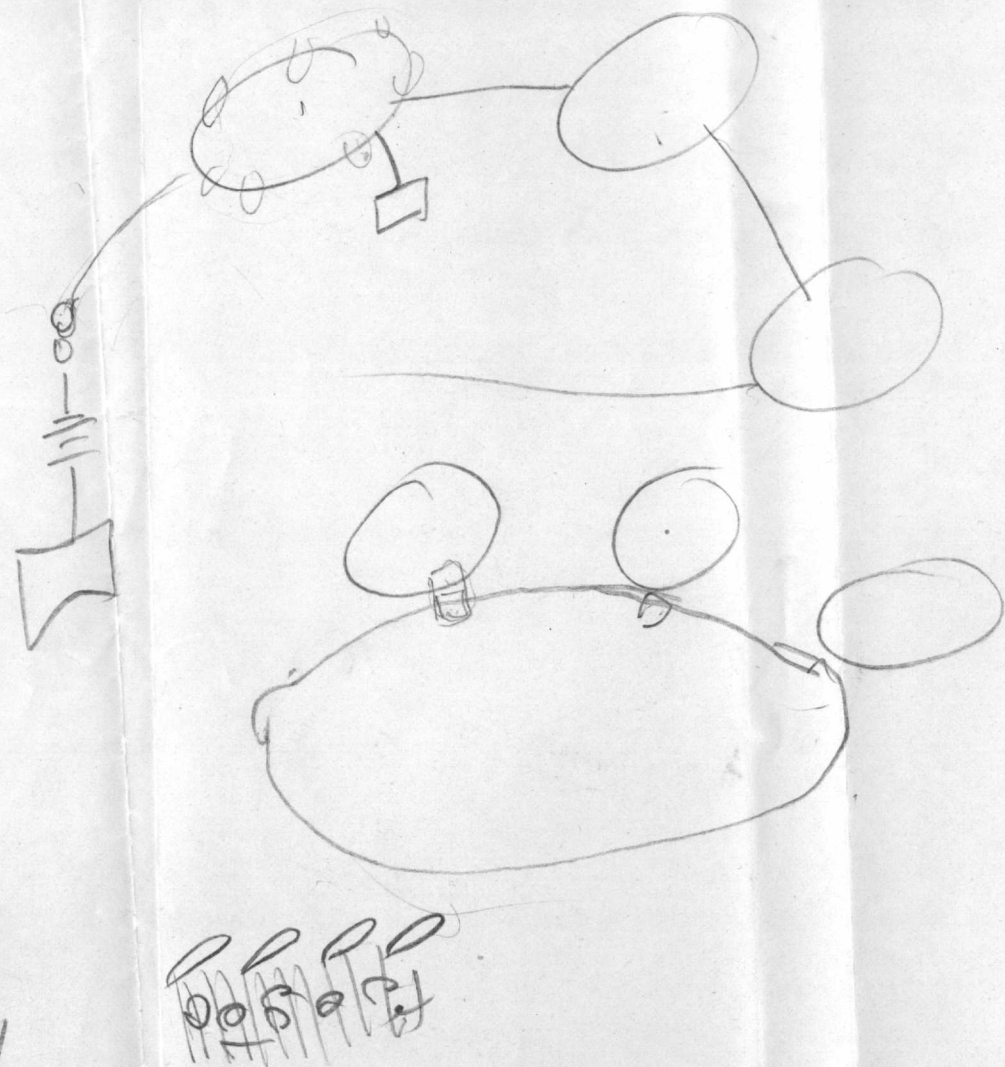
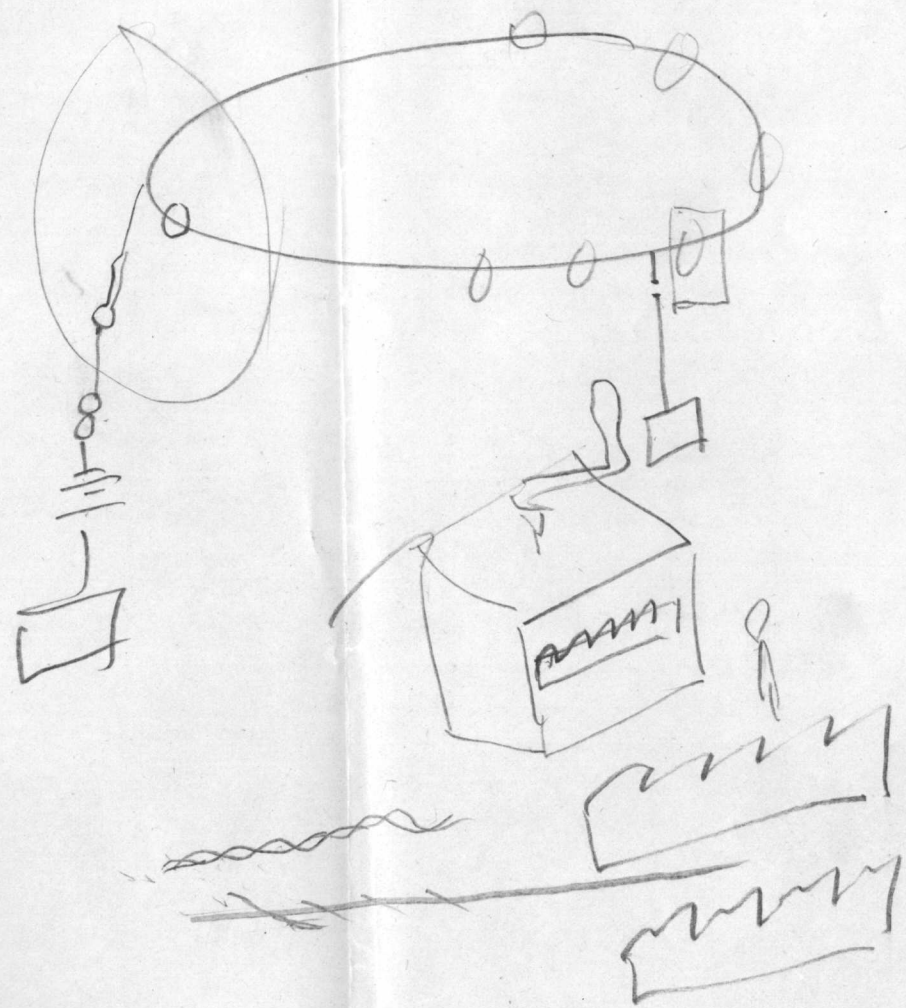


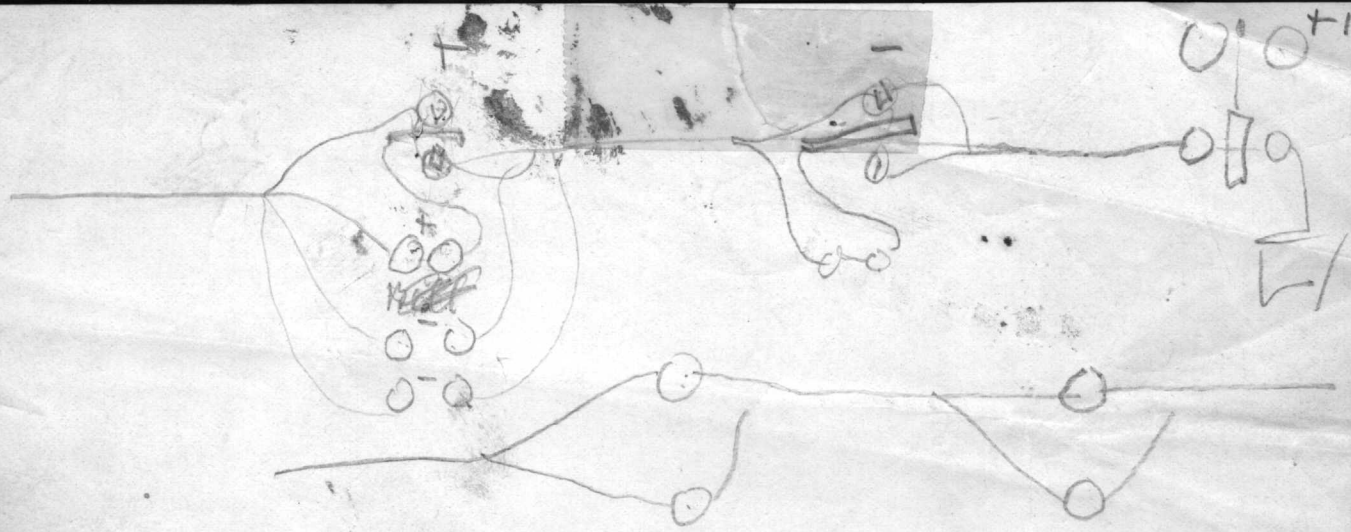
(Relay arm.)



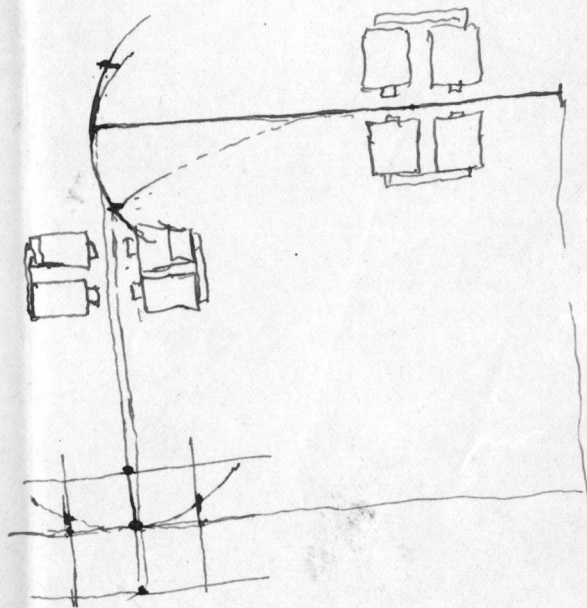
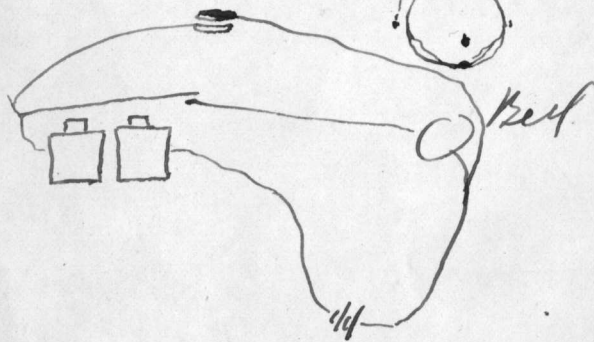
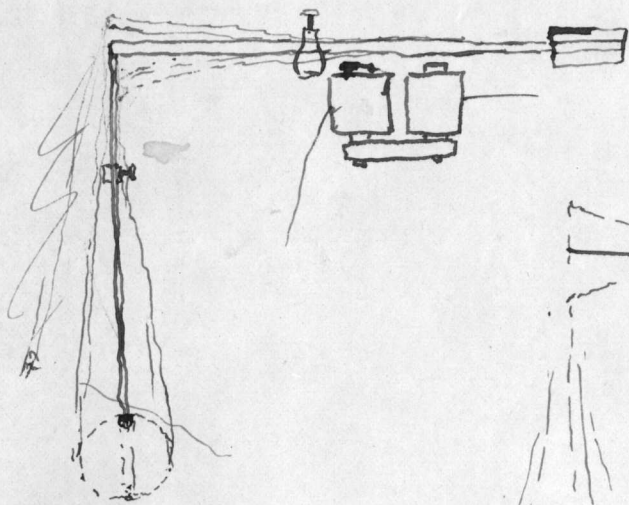


Silene Arvensis vibrata G. meum f. Raril  
Gramine " " " " " "

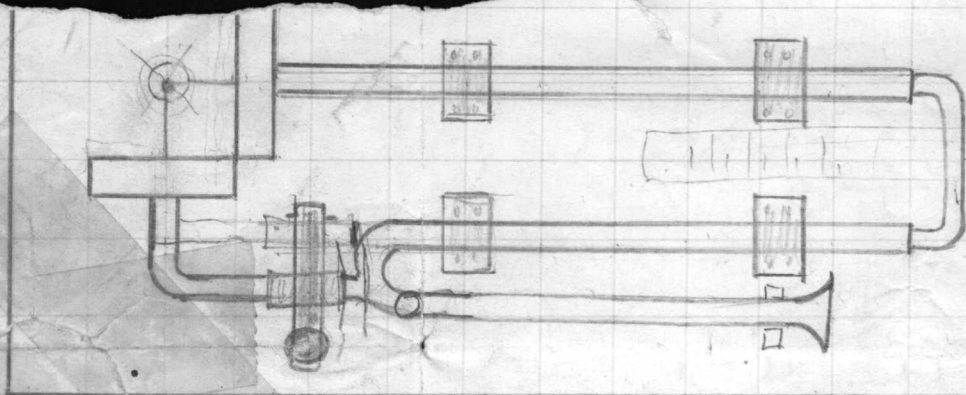










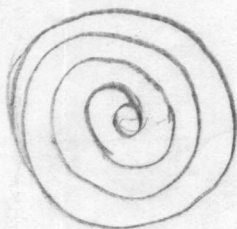


522

Base board 3ft long by 1ft wide

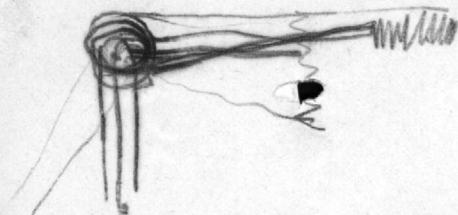
Brattle St corner of Spark St - 2

1100

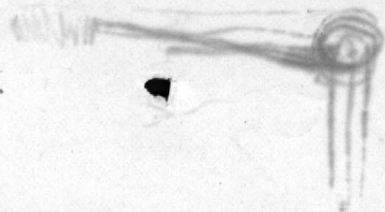


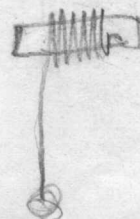
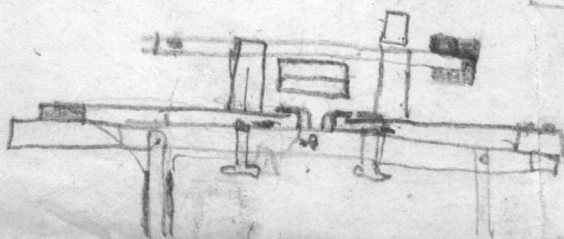
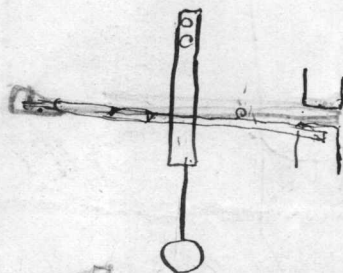
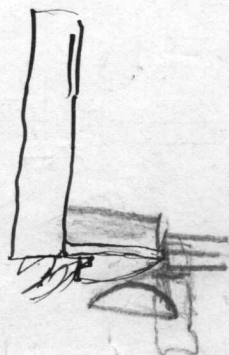
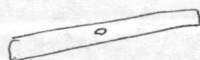
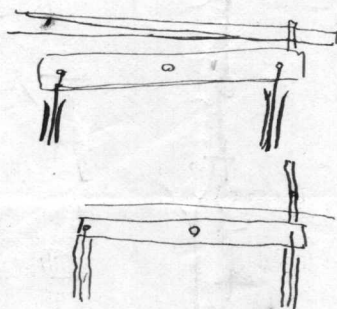
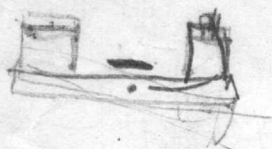
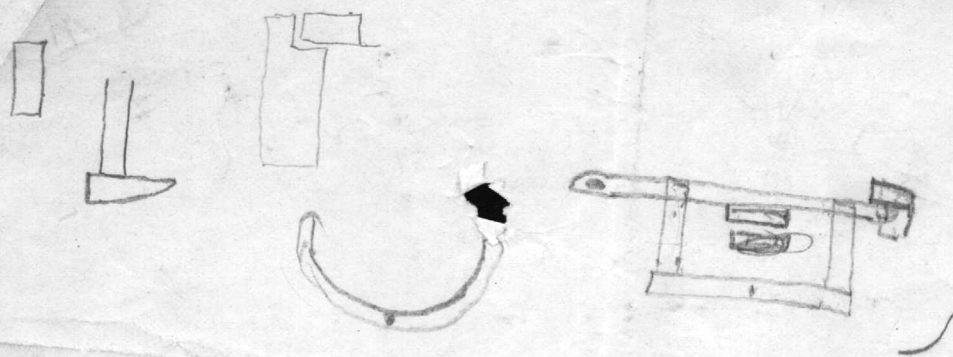
~~/\$~~ 2000

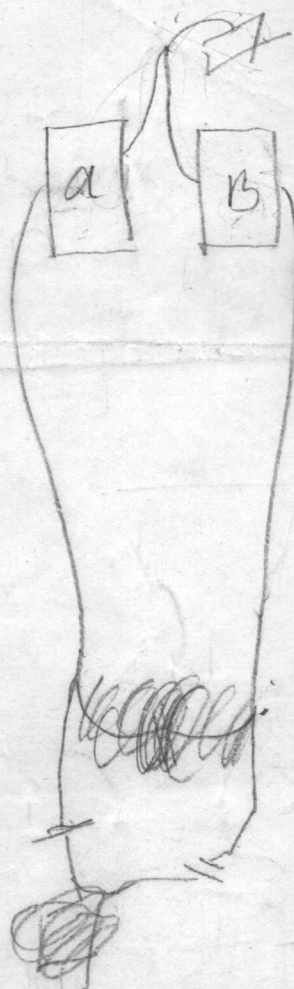
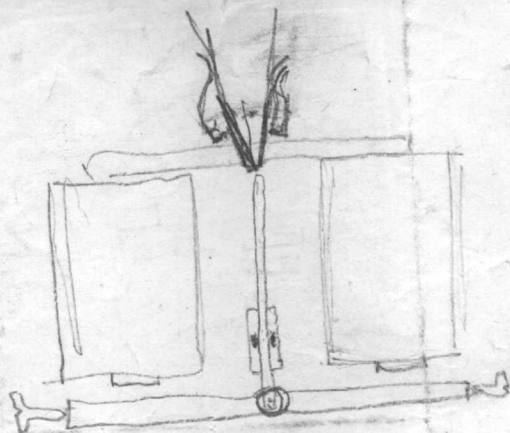
Tim Tim



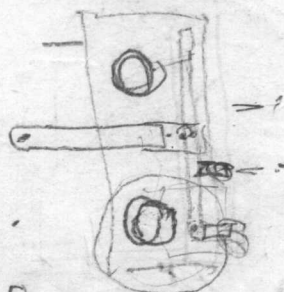
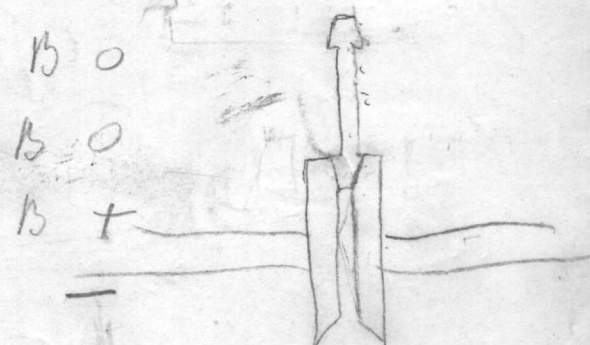






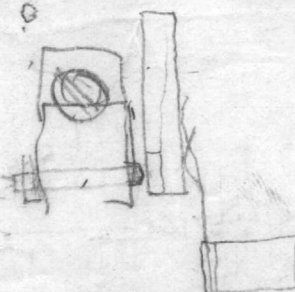


1 A	+	B 0
2 A	-	B 0
3 A	0	B +
4 A	0	-
5 -	+	+
6	-	+
4	+	-
6	-	-



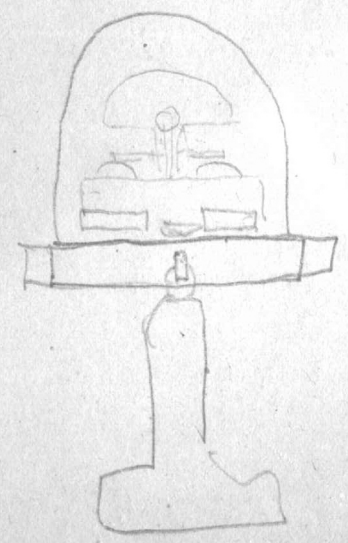
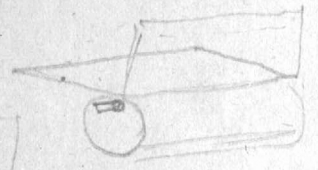
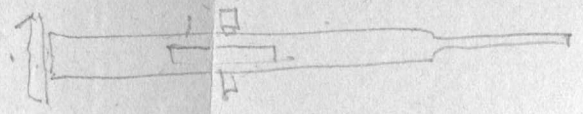
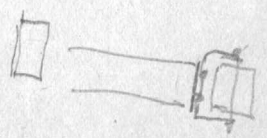
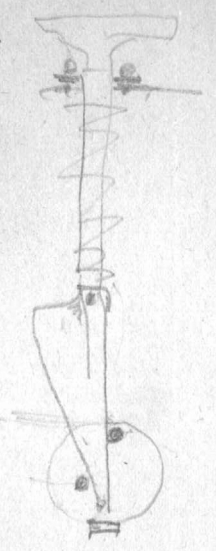
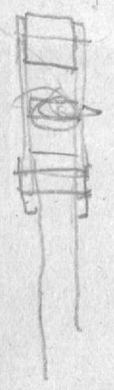
0 0

0 0

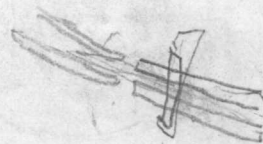
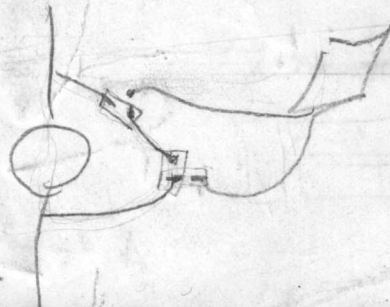
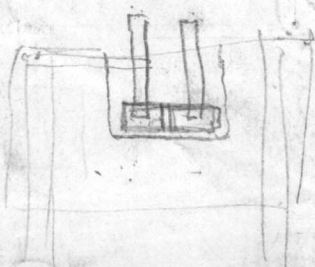
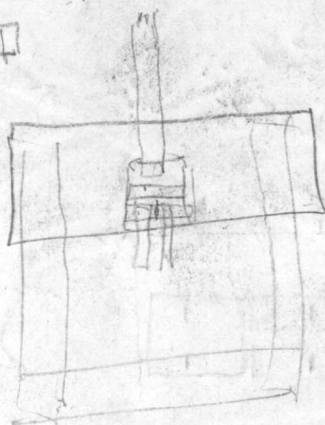
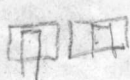
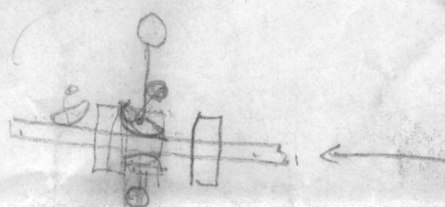
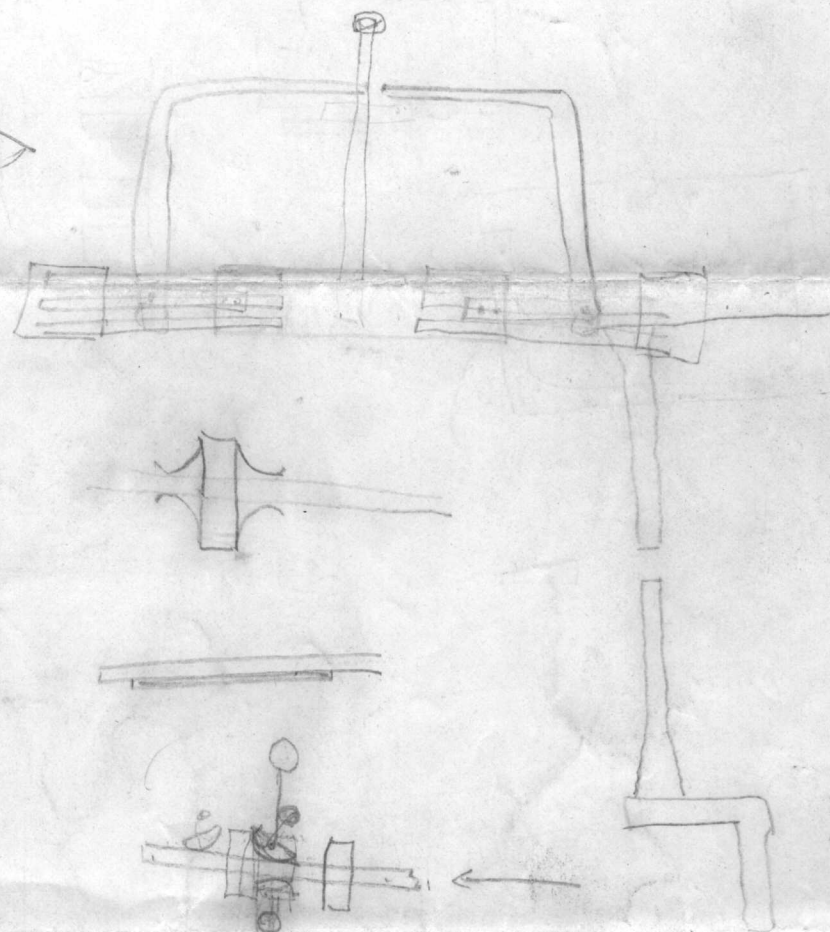
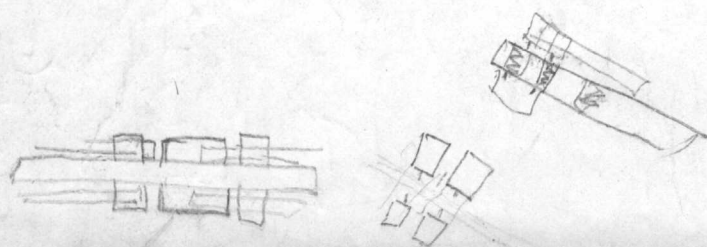
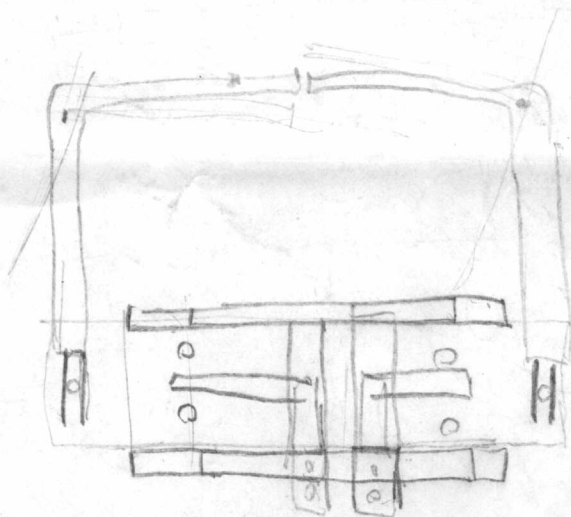
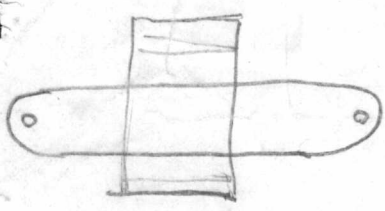
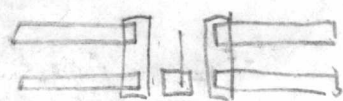
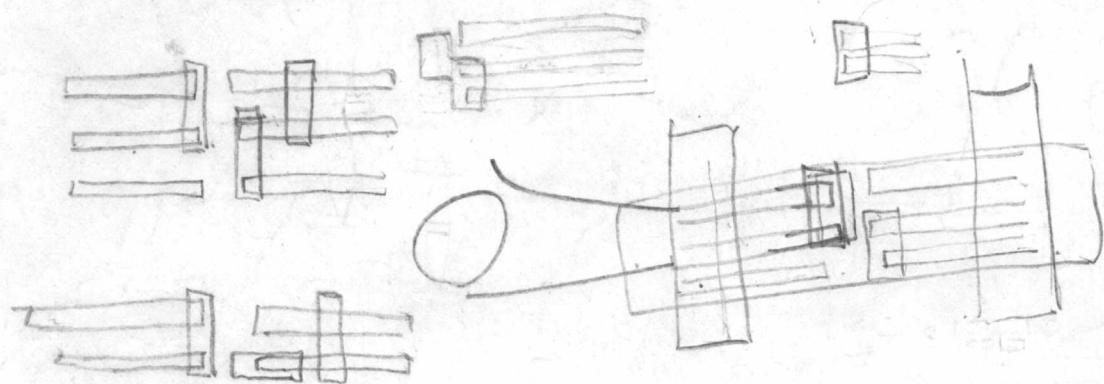


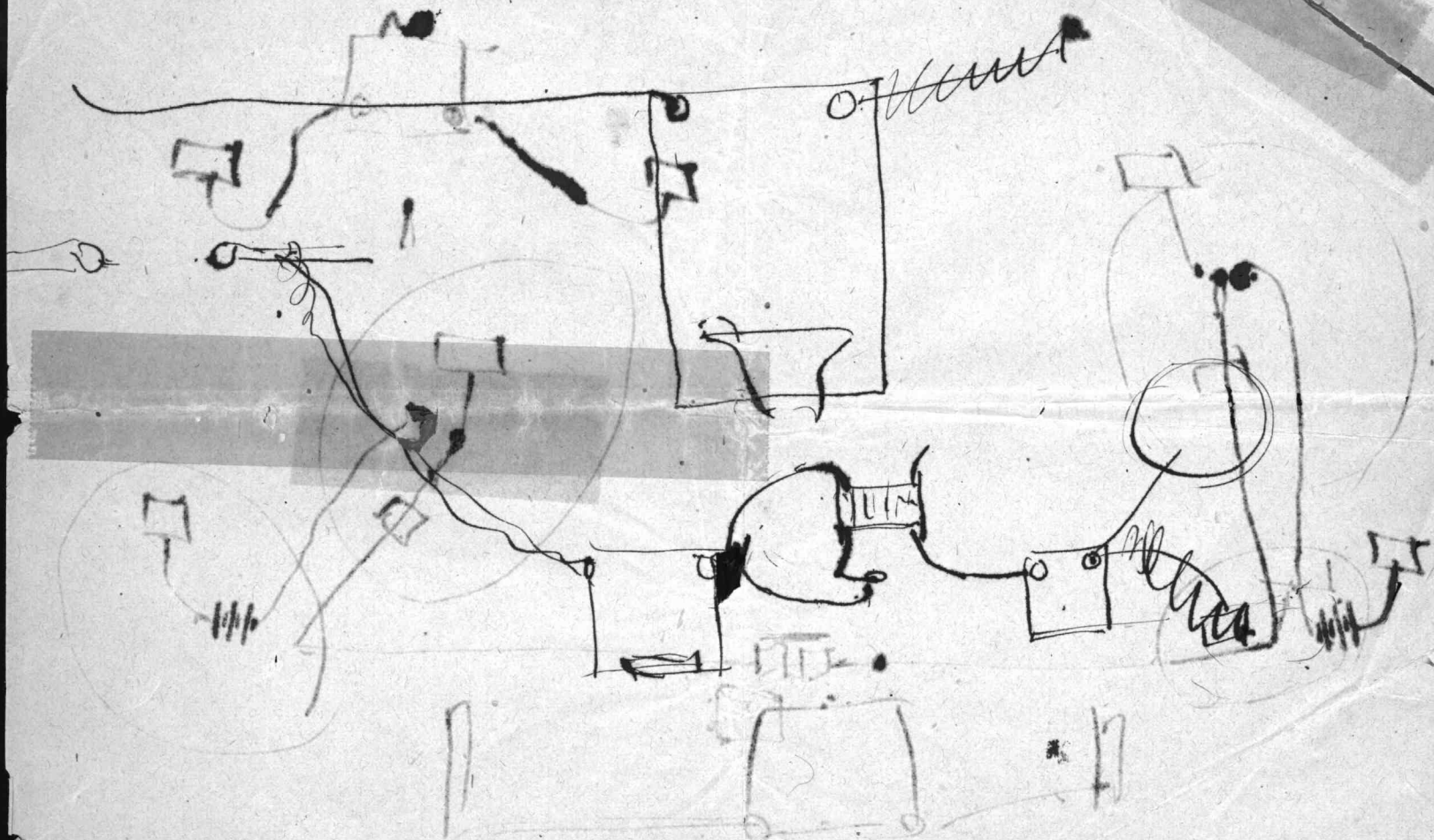
350  
300  
105,000

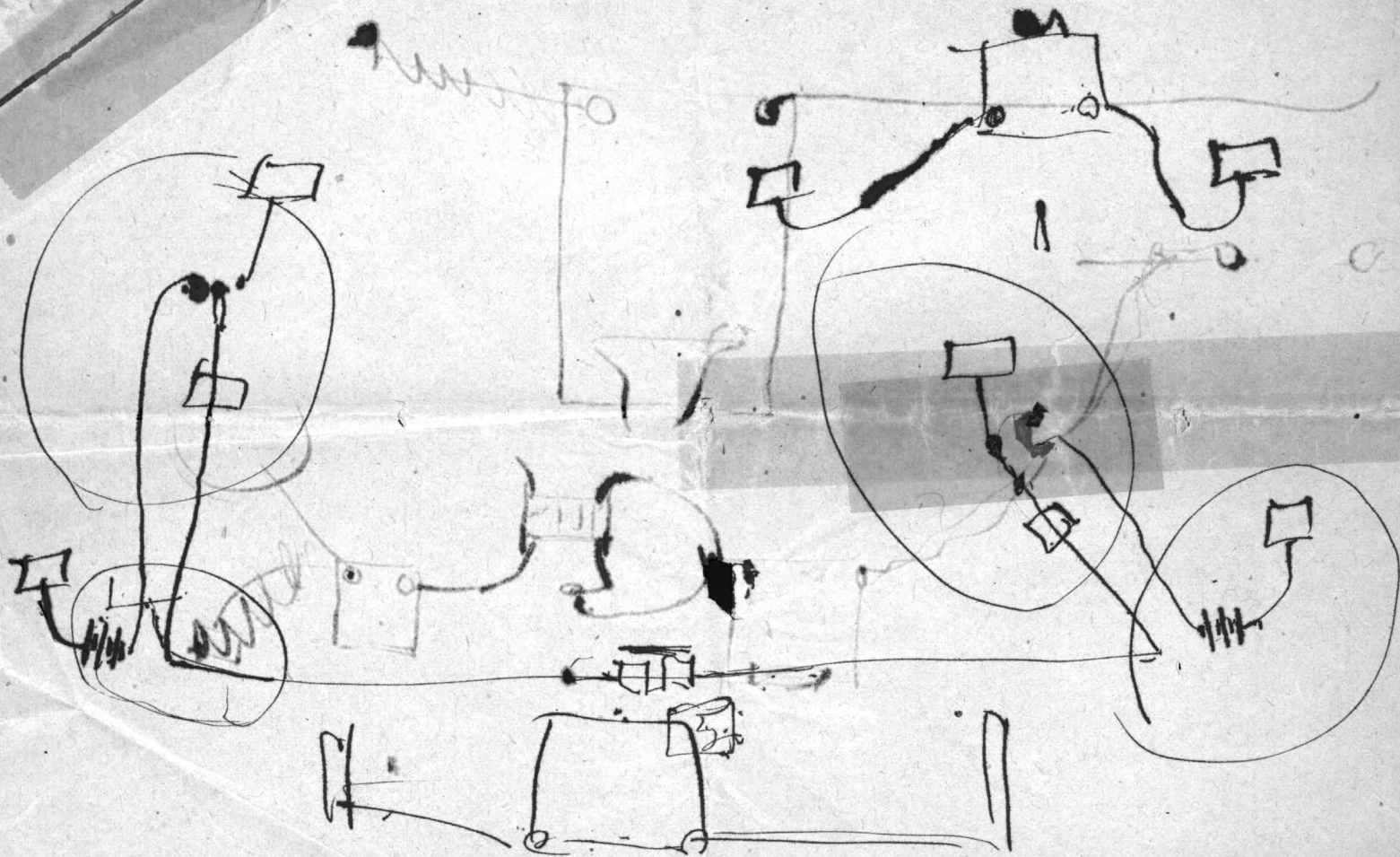
1



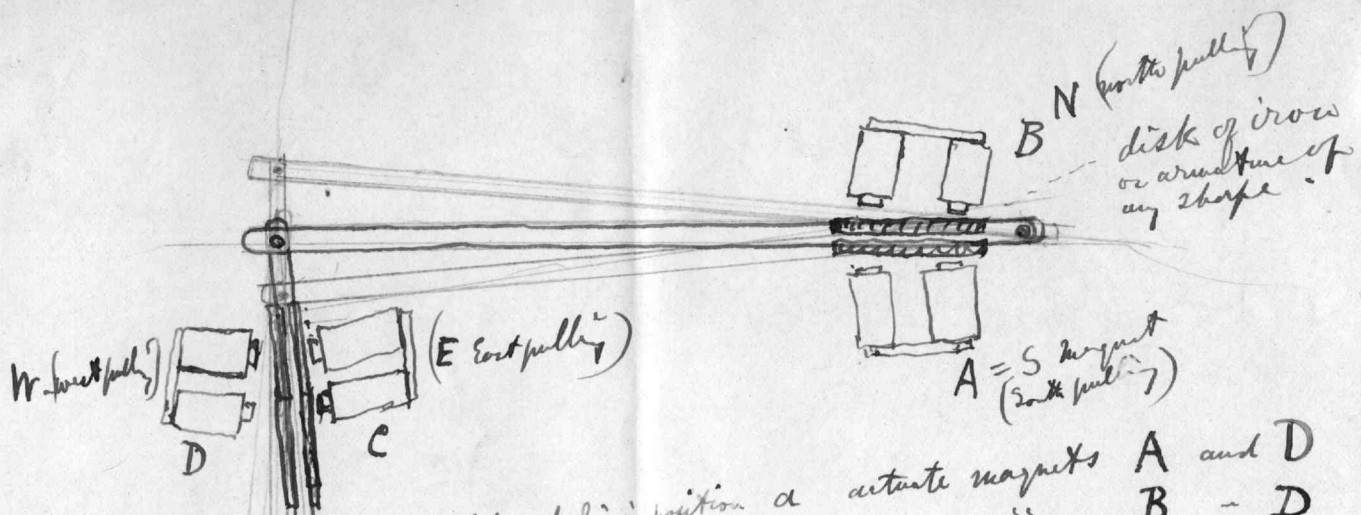










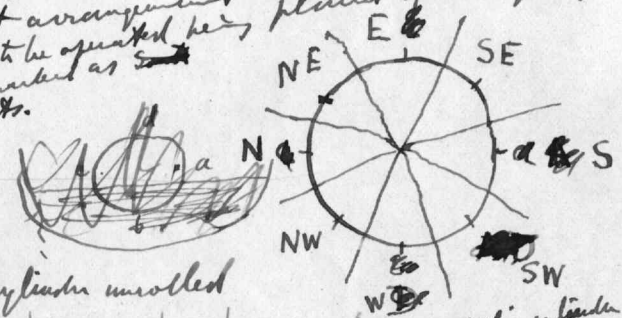


Let Z be the metallic axle of machine & cylinder be caused to revolve by frictional contact with Z. No cylinder better be attached to wheel & Z in contact - or let Z be represented by mercury trough.

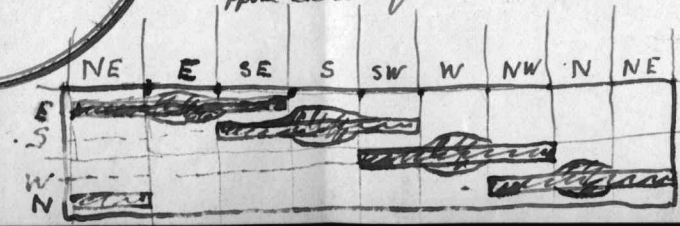
When wheel is in position

a	actuate magnets	A and D
b	"	B - D
c	"	B - C
d	"	A - C

~~Current stop~~  
 Have break circuit and induced current will not trouble as  
 More exact arrangement & would be as below  
 the magnets to be operated by placed in the proper  
 segments & marked as ~~S~~  
 N, S, E, W, magnets.



Suppose the cylinder unrolled



Non-metallic cylinder with conducting strips ESWN connected with corresponding magnets. Let strips be of carbon or other insulating material & let them be broad at the center where the commutator is attached and taper to a point at the side. A metallic rolling Z connected with battery a passed over cylinder.



Maynard's Lane  
Central office

Nat. curr.  $4^{\circ}$  deflec. copper current -

170

zinc

250

copper

Capitol

430

zinc

360

Copper

Natural current = 17 degrees to left -

Government Printing office

500

zinc

600

Copper

Natural current =  $19^{\circ}$  to right

Copper to ground same deflection to right.

Resistant Resistances

Central office - 210

Copper current equal to 40 ohm resist

Capitol - 395

Zinc current equal to 35-ohm resist

Govt Print. off. 550

Copper current equal to 50 ohm resist.

44

$5.25 \div 4.24 \approx 1.24$      $4.8 \div 4.75 \approx 1.01$      $4.8 \div 4.75 \approx 1.01$     ?

$$\begin{array}{r}
 3392 \\
 1696 \\
 \hline
 20.352
 \end{array}$$

$$\begin{array}{r}
 5252 \\
 19100 \\
 \hline
 1050
 \end{array}$$

$$\begin{array}{r}
 424 \overline{) 1575} \quad (3.71) \\
 \underline{1272} \\
 3030 \\
 \underline{2968} \\
 620 \\
 \underline{424} \\
 1960
 \end{array}$$

$$\begin{array}{r}
 5250 \overline{) 20.352} \quad (3.87) \\
 \underline{15750} \\
 46020 \\
 \underline{42000} \\
 40200
 \end{array}$$

$$\begin{array}{r}
 4.24 \\
 4.6 \\
 \hline
 4
 \end{array}$$

$$\begin{array}{r}
 4.6 \\
 5.8 \\
 \hline
 368
 \end{array}$$

$$\begin{array}{r}
 388 \\
 19
 \end{array}$$

$$\begin{array}{r}
 424 \quad 468 \\
 23 \quad 23 \\
 \hline
 1272 \\
 848
 \end{array}$$

$$\begin{array}{r}
 5 \overline{) 230} \\
 \underline{25} \\
 2668 \\
 \underline{25}
 \end{array}$$

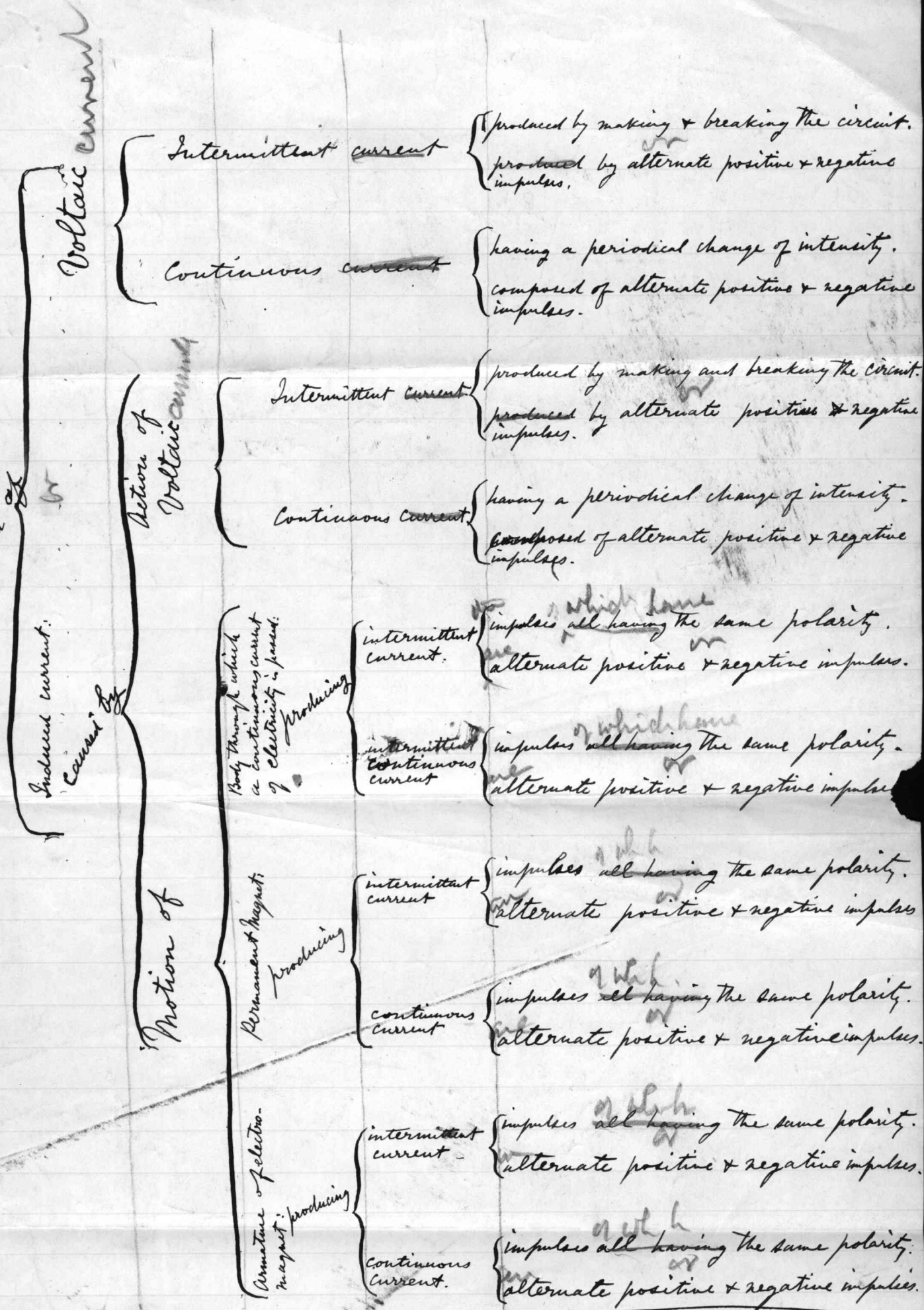
$$\begin{array}{r}
 19 \overline{) 97.52} \quad (5.13) \\
 \underline{95} \\
 25 \\
 \underline{19} \\
 62
 \end{array}$$

Our improvements will be understood by reference to the accompanying diagram  
which represents a number of electric telephones ~~connected~~ <sup>arranged</sup> in a circuit  
upon a ~~single~~ <sup>common</sup> arrangement upon circuit of a number of  
~~Fig I~~ <sup>Fig I</sup> a telegraphic circuit some of which are ~~represented~~ <sup>shown</sup>  
as operating other telephones upon secondary circuits.

Fig I ~~is~~ <sup>is</sup> a telephone similar to that described in Letters  
Patent No. ~~1977~~ <sup>1977</sup> excepting that  
a single coil ~~a~~ <sup>is</sup> surrounds both poles of the permanent  
magnet ~~b~~ <sup>c</sup> ~~the poles being~~ <sup>near together so as to</sup>  
under the magnetic field very small & intense.



The vibratory current employed for the purposes of multiple telegraphy may appear in the form of



~~The new invention which I am designing~~

~~I am anxious to be first with latest invention~~  
~~and to make in advance of the rest of the world in America & Europe~~  
~~any only defining applications here until I have can~~  
~~find parties to take up the matter about~~



It frequently happens that when ~~some~~ <sup>an</sup> inventor by dint  
of hard work - and laborious research - brings  
to perfection some startling discovery and proves  
its reality in the face of an incredulous world  
- others will afterwards appear to rob  
~~the inventor~~ <sup>him</sup> of the credit of his discoveries and to  
appropriate the fruits of his labours.

When in 1876 Sir William Thomson first  
directed <sup>public</sup> attention to the results I had obtained  
in the production of articulate sounds by  
electrical means - it was only the  
few who had reliance

I have been somewhat amused at the articles that have appeared ~~in the public~~ from time to time in the public press concerning the original inventor of the Speaking Telephone

Art

Interference A is declared upon the ~~method~~ <sup>of transmitting</sup> articulate speech by the production of modulatory currents of Electricity

A Interference A is declared upon the Art of transmitting or reproducing at a distance the sounds of articulate speech by means of ~~the~~ modulatory currents of Electricity.

B - Interference B is declared upon <sup>a particular</sup> ~~one of the~~ methods of producing ~~the~~ modulatory currents of Electricity - viz <sup>by</sup> ~~the~~ <sup>the</sup> ~~product~~ <sup>varying</sup> the resistance of the circuit.

C. Interference C. is declared upon one of the ways in which the resistance of the circuit may be varied so as to produce modulatory currents of Electricity viz - by introducing into the circuit a liquid or equivalent substance of high resistance.

D. Interference D is declared upon <sup>one of the</sup> mechanical details of an apparatus for varying the resistance of a circuit through the medium of a liquid so as to produce modulatory currents of electricity.



In J. the ~~apparatus itself~~ combination  
constituting the apparatus itself &  
claims; ~~irrespective of its use~~

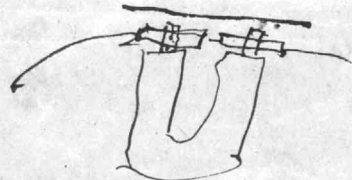
In F and I the claim is to the use  
of the apparatus as a Transmitter;

In E and G - to its use as a Receiver;  
and in H<sup>K</sup> to its use either as a Transmitter  
or Receiver.

The distinction between E & G is simply  
that the ~~word "plate"~~ is ~~not~~ Term.  
"elastic inductive plate or armature" is  
used in E<sup>K</sup> where "diaphragm" is mentioned  
in G<sup>K</sup>. ~~That between F & I is substantially~~  
~~the same distinction~~ The difference between H and  
K also is simply that in K the magnet  
~~employed is~~ is of the horse-shoe form while  
in H

The distinction between E & G  
is simply that the term "elastic inductive  
plate or armature" is used in E where  
"diaphragm" is mentioned in G.

~~The difference between F & G is that~~  
~~the term "plate"~~ F & I are also distinguished by  
I specifying ~~"plate"~~ "iron or steel diaphragm"  
as "elastic inductive plate or armature" where  
F mentions a "disc or diaphragm" and by the  
omission of the word "core" which  
occurs in I.





1<sup>st</sup> of May (31 wholems)

Total number of rounds — 1116

Total number of rounds correct — 569

Percentage of defects — 49

$$\begin{array}{r} 38 \overline{) 1057} (28 \\ \underline{76} \\ 297 \\ \underline{304} \end{array}$$

10<sup>th</sup> of June

Total number of rounds 1116

Total number of rounds correct ~~718~~ 870

~~Total number of rounds~~ 22  
Percentage of defects.

1<sup>st</sup> Improvement

Total number of rounds gained

1<sup>st</sup> Percentage of gain 28%

$$\begin{array}{r} 368 \quad 4 \quad 246 \quad 31 \overline{) 569} (18 \\ \underline{38} \\ 288 \\ \underline{108} \\ 1368 \\ \underline{311} \\ 1057 \end{array} \quad \begin{array}{r} 31160 (22 \\ \underline{2736} \\ 3760 \\ \underline{3104} \end{array} \quad \begin{array}{r} 31 \overline{) 870} (28 \\ \underline{31} \\ 569 \\ \underline{259} \\ 248 \\ \underline{1190} \\ 870 \\ \underline{62} \\ 250 \\ \underline{248} \\ 20 \end{array}$$

~~If a succession of strokes be imparted to the air at a dist. dist.~~ When we clearly perceive that sound results from a ~~partic. kind~~ movement of the air, we shall realize that the means by which that motion <sup>itself</sup> is prod, ~~in the air~~ is immater. to the production of the sound.

For instance - it is as feasible to produce spoken words by the mech. movement of a piece of wood or iron as to produce th. by the vocal organs. ~~All that~~ It is only necessary to move the wood or iron in the same way that the air is moved by the voice & the same results follow.

---

Part of sound itself

Means by which sound can be produced.

Receiving end (necessities)

Current (necessities)

Transmitting end (necessities)

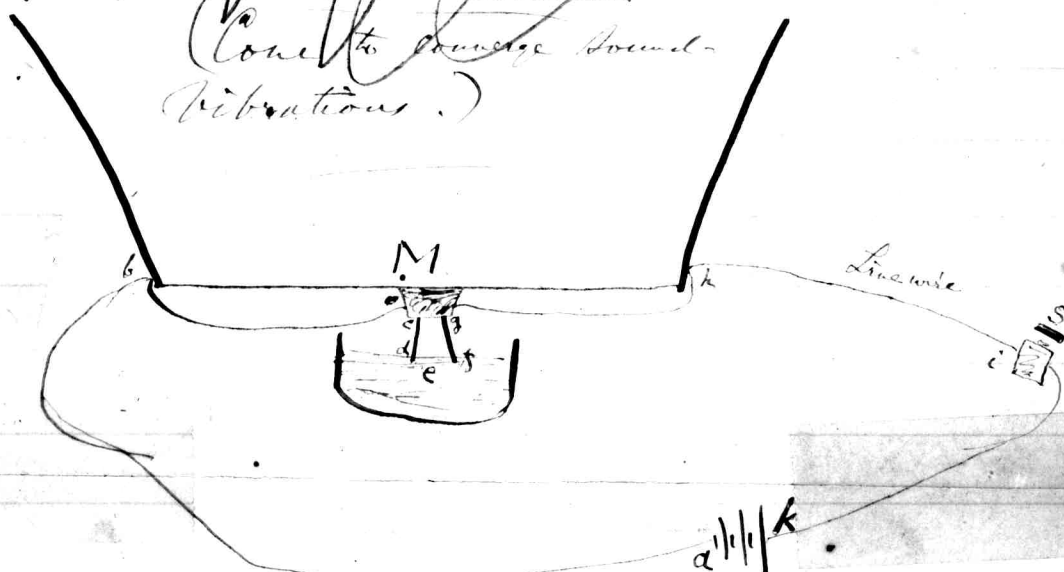
Forms of apparatus

Theoretical Investigation of the effects produced <sup>upon</sup> ~~by the~~ voltaic current by the vibration of the conducting wire in a liquid included in the circuit.

### Plan of the Investigation.

1. Consider the general effects of the vibrations.
2. Consider the effect of varying each element in the resistance.
3. Consider the best means of increasing the amplitude of the electrical undulations.

(Come to source sound-vibrations.)



1. When a sound is made in the neighbourhood of the membrane  $M$ , the <sup>aerial</sup> ~~vibrations~~ <sup>undulations</sup> acting upon the membrane throw it into vibration. The wires  $cd, gf$ , are caused to dip more or less deeply into the water  $e$  accordingly as the membrane  $M$  is depressed or elevated. The more deeply the wires  $cd, gf$ , are immersed the less resistance does the liquid  $e$ , offer to the passage of the current. Hence the vibrations of  $M$  occasion variations in the resistance of the circuit  $ab c d e f g h i k$ ; and thus affect the intensity of the current traversing it.

But the magnetization of  $(i)$  (an electro-magnet placed in the circuit) is ~~affected~~ dependent upon the intensity of the current traversing its coils; hence the vibration of  $M$  causes the electro-magnet  $(i)$  to attract its armature  $S$  with <sup>a varying</sup> ~~greater or less~~ force.

If the armature  $S$ , be so arranged as to be capable of free motion then the vibration of  $M$  produces an exactly similar vibration of  $S$  - Wherefore the sound resulting from its motion is similar to that which caused the motion of  $M$ .

2. In order to obtain the best audible effect at  $S$  - <sup>The</sup> amplitude of vibration of  $S$  should be as great as possible. ~~Therefore~~ <sup>Hence</sup> The amplitude of the electrical undulations traversing the circuit  $ab c d e f g h i k$ , should be large; or in other words the difference between the maximum and minimum of intensity in the current should be as great as possible.



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